Caroline B. Thomas, M.D.
The Johns Hopkins Sch. of Med.

Report #1
I
TRC Grant #283

Part C. Plans for the Future.

CONFIDENTIAL

After July 1, 1958, our research program will be attached to the newly inaugurated Division of Medical Genetics within the Department of Medicine. A full-time statistician is to be appointed, whose services will be shared equally by Dr. Victor A. McKusick, Head of the new Division, and Dr. Caroline B. Thomas, for her studies of possible precursors of hypertension and coronary heart disease. Dr. Abraham Lilienfeld, an epidemiologist of highest caliber, is to have a dual appointment in the Division of Medical Genetics and the School of Hygiene and Public Health, where the appointee is to fill the newly created Professorship of Chronic Diseases. For the first time, therefore, an epidemiologist of stature will be available for close and continuing collaboration in planning our future work and follow-up studies. Also, there are to be several trainees in the field of Medical Genetics, one or more of whom may assist Dr. Thomas' studies. Finally, Mrs. Bernice H. Cohen, who analyzed the data for our studies of familial hypertension and coronary disease, is to receive her Ph.D. degree in Human Genetics under Dr. Bentley Glass at the Johns Hopkins School of Medicine in June, 1958 and will be associated with Dr. Thomas and Dr. McKusick after September, 1958. Her thesis has to do with the relationship of ABO and Rh blood groups to selective fetal loss, and she has done other work along these lines which makes her something of a specialist in regard to the genetics of blood groups.

Circumstances are, therefore, extremely favorable for vigorous inquiry into the following question:

Do smokers and nonsmokers have demonstrable genetic differences?

Our recently published family studies described in Part A and Appendix I suggest that genetic differences do, in fact, exist. This is an extremely important point from the public health standpoint, in view of studies indicating that heavy smokers have higher death rates from cancer of the lung and coronary disease than nonsmokers, and every effort should be made to establish the truth of the matter by the use of as many genetic indicators as possible. On a recent visit to Baltimore, Sir Ronald Fisher, eminent British statistician, discussed the problem and suggested that analysis of the various blood groups, of which there are now some nine, plus other "markers," might settle the matter. He stated that satisfactory proof of genetic differences would be at hand if one or more blood groups occurred in significantly different proportions among smokers and nonsmokers. Other human genetic indicators of which there are now more than twenty, could also be used in the same way to provide independent evidence.

In his recent report, Heath indicates that he did not find significant differences in the blood groups of 61 nonsmokers, 95 moderate and 96 heavier smokers selected from among Harvard undergraduates (Part A ref. 1). However, he did not study the Rh factor, he tells me, or other rarer blood groupings; his observations were confined to studies of the ABO group.

The proposed studies for September 1, 1958 -- August 31, 1959 are in two parts:

1. Studies of genetic differences between smokers and nonsmokers: cholesterol levels, Rh and ABO blood groups, other genetic indicators. This study would check our findings of positive relationships between smoking and higher cholesterol levels and between smoking and parental history in a larger and

different population; obtain new information in regard to the Rh factor and other genetic indicators, and amplify Dr. Heath's observations on the ABO blood group, in view of the fact that the numbers in his series were small.

a. Subjects: blood bank donors at the Johns Hopkins Hospital. There are around 10,000 healthy donors per year; Rh and ABO blood groupings are carried out on them all routinely, and a brief medical history is obtained.

b. Additional data to be gathered: smoking habits and parental history on all possible donors; serum cholesterol and other genetic indicators on statistically suitable groups.

c. Collaborators: Dr. McKusick, Dr. Lilienfeld and Mrs. Cohen.

d. Statistical design: details to be determined after Dr. Lilienfeld and Mrs. Cohen join the Division of Medical Genetics.

e. Needs: (1) statistical clerk
(2) service fees for laboratory tests
(3) office supplies, reprints, etc.

2. Studies of psychological differences between smokers and nonsmokers as shown by comparison of figure drawings.

The use of figure drawings provides a new approach to the understanding of differences in the personality of smokers and nonsmokers. This projective technique has attracted much interest as a clinical tool, and is beginning to be used in a quantitative way to characterize contrasting groups of subjects (1-5). Over 600 Johns Hopkins medical students (classes of 1952 through 1961) have completed figure drawing tests. These have been analyzed by Dr. Edward Slockbower, the Psychologist associated with our study, who is outstanding in his field. In the next two years, it is our intention to classify the figure drawing material from many points of view, making cross correlations with our extensive genetic, physiological and psychological data. It is thought that a broad classification of figure drawings can be developed from our multifaceted studies which will be of great assistance to others working with healthy young adults of superior intelligence. At present no such unified classification of "normal" human figure drawings exists.

In view of the finding by Heath, using a combined questionnaire and interview method, of statistically significant personality differences between smokers and nonsmokers, (Part A, ref. 1) efforts should be increased to discover valid objective differences through the use of psychological tests. Preliminary studies along these lines using the Rorschach test were not very encouraging, but are being continued (see Part A). The figure drawing test is an independent projective method. It should be possible to determine with confidence whether or not quantitative differences in the figure drawings of smokers and nonsmokers exist by:

a. direct measurement, counting and comparison of the drawings themselves (size, activity and position of figures, clothing or lack of clothing, proportion of transparencies, stick figures, omission of parts, etc.)

b. comparison of the frequency of attributes described by Dr. Slockbower

in his analyses of the figure drawings without any knowledge on his part of the smoking habits of the subjects studied.

c. identification and measurement of a number of "indicators" described in the literature as of statistical importance in certain comparisons: younger people versus older people, for example.

These studies then, will be planned as follows:

d. Subjects: over 600 Johns Hopkins medical students

e. Additional data to be gathered: accurate objective description and measurement of over 1200 figure drawings (each subject draws a man and a woman).

f. Collaborators: Dr. Edward Slockbower, Dr. Mary Ainsworth, Associate Professor of Psychology, the Johns Hopkins University.

g. Statistical design: in general, the plan will be along the lines described above, with the assistance of our collaborators and statistician as the project actually starts and thereafter.

h. Needs: (1) statistical clerk
(2) office supplies
(3) funds for reproducing figure drawings by Xerox method

References

1. Levy, S.: L.E. Abt and L. Bellak (Eds.), Projective Psychology. N.Y.: Knopf, 1950, pp. 257-297.

2. Lorge, I., Tuckman, J., and Dunn, M.B., Am. Psychologist, 9:420, 1954.

3. Silverstein, A.B. and Robinson, H.A., J. Con. Psychology, 20:333, 1956.

4. Reznikoff, M. and Tomblen, D., J. Con. Psychology, 20:467, 1956.

5. Lakin, M., J. Con. Psychology, 20:471, 1956

Itemized Annual Budget

September 1, 1958 - August 31, 1959

Salaries:		$5,500.00
A. Director	$2,000.	
B. Statistical clerks (two, part-time)	3,500.	
Expendable Supplies		222.25
Permanent Equipment		--- --
Fees for service: cholesterol determinations, other genetic indicators, reproduction of figure drawings, reprints, etc.		4,200.00
Social Security (2.25% of $3,500* (est.))		78.75
Net appropriation		10,000.00
Overhead (15% of direct costs, based on actual expenditures (est.))		1,500.00
Total appropriation		$11,500.00

*Estimate does not include SS. Tax from item A, as this S.S. Tax has already been deducted from another budget.

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